CO_2 Sequestration in Ocean-Planets?

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Ocean-Planets are a new family of possible planets in between the rocky terrestrial planets and the gaseous giants (Leger et al. 2004). They are of great potential interest for Exo/Astrobiology, due to their global ocean. They are candidates for detection by space missions such as Eddington, Kepler, and possibly COROT. CO_2 is considered an important minor constituent of these planets. We address the problem of the CO_2 abundance in the atmosphere, the ocean, and the underlying high-pressure ice mantle. We use an EOS for high pressure H_2O-CO_2 mixture to show that CO_2 demixion takes place at high pressure, which leads to CO_2 sequestration in the lower liquid and ice layers of the planet. This lowers appreciably the CO_2 atmospheric content and the corresponding greenhouse effect.